

WHAT IS CLAIMED IS:

1. A method of making a stamper or stamper ancestor for fabricating an optical disk comprising:

forming a substrate having a corrugated upper surface profile;

5 depositing a layer of material onto said upper surface so as to form a combined substrate and layer structure having an upper surface profile comprising an adjacent series of structures having a substantially hemi-cylindrical contour.

2. The method of Claim 1, wherein said forming comprises grooving a substrate with a spiral groove.

3. The method of Claim 1, wherein said forming comprises depositing, exposing, and developing a photoresist.

4. The method of Claim 1, wherein said forming comprises etching through an exposed and developed photoresist layer.

15 5. The method of Claim 1, wherein said forming comprises forming a substrate having an approximately sinusoidal upper surface profile.

6. The method of Claim 1, wherein said forming comprises forming a substrate having an approximately rectangular upper surface profile.

7. The method of Claim 1, additionally comprising:
20 depositing metal onto said combined substrate and layer structure;
removing said metal to form an inverted replica.

8. A stamper or stamper ancestor made with the method of Claim 1.

9. A method of making an optical data storage media, said method comprising:

25 forming a substrate having a corrugated upper surface;

depositing at least one layer of optically active material over said substrate;

30 depositing a layer of material onto said optically active material so as to form lenses over said optically active material having a substantially hemi-cylindrical contour.

10. The method of Claim 9, wherein said depositing at least one layer of optically active material comprises depositing a phase change stack.

11. The method of Claim 9, additionally comprising bonding a substantially transparent cover sheet onto said lenses.

5 12. The method of Claim 11, wherein said cover sheet comprises polycarbonate.

13. An optical data storage medium made with the method of Claim 9.

14. A method of reading data from an optical disk comprising positioning a read or read/write laser having a sub-wavelength aperture proximate to the surface of an
10 approximately hemi-cylindrical lens covering an optically active layer of an optical recording medium.

15. The method of Claim 14, wherein said laser is positioned between about 0.5 to 2 wavelengths away from the surface of said approximately hemi-cylindrical lens.

16. A method of making sub-micron structures which are substantially
15 radially symmetric, said method comprising depositing material onto a template having a corrugated surface profile along at least one dimension, wherein said depositing is performed such that the growth rate of deposited material is substantially constant in all directions normal to the template surface profile.

17. The method of Claim 16, wherein said template is corrugated in a spiral
20 pattern, and a substantially hemicylindrical structure over said spiral is formed.

18. The method of Claim 16, wherein said template is corrugated in two approximately orthogonal directions, and substantially hemispherical structures are formed at the peaks of the corrugation.

19. A method of making an optical data storage medium comprising:
25 forming one or more convex substantially hemicylindrical structures with a deposition process characterized by substantially uniform growth on a template substrate;

serially replicating said structures to form a stamper having one or more convex substantially hemicylindrical structures;

molding a plastic blank using said stamper as part of a mold assembly to form a plastic substrate having one or more concave grooves with a substantially hemicylindrical contour; and

5 filling said grooves with a dielectric material so as to form convex lenses when viewed from the surface of the plastic blank opposite from the grooved side.

20. The method of Claim 19, wherein said plastic blank comprises polycarbonate.

21. An optical data storage medium made with the method of Claim 19.

10 22. A stamper or stamper ancestor for fabricating an optical disk that is made by a method comprising depositing material onto a template having a corrugated surface profile along at least one dimension, wherein said depositing is performed such that the growth rate of deposited material is substantially constant in all directions normal to the template surface profile such that substantially radially symmetric structures are formed.

15 23. An optical data storage medium that is made by a method comprising depositing material onto a template having a corrugated surface profile along at least one dimension, wherein said depositing is performed such that the growth rate of deposited material is substantially constant in all directions normal to the template surface profile such that substantially radially symmetric structures are formed.

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